Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the ~~state~~ level of depression of the CNS of said subject, said method comprising:

a) acquiring at least one ~~a plurality of~~ reference signals, ~~each~~ said at least one reference signal corresponding to a distinct CNS state obtained from a one or more reference subject or subjects;

b) selecting a wavelet transformation function which, when applied to one ~~of~~ said at least one reference signals ~~or said observed signal~~, yields a set of coefficients;

c) selecting a statistical function which, when applied to said set of coefficients derived from ~~one of~~ said at least one reference signals, or a subset of ~~one of~~ said set of coefficients, yields a reference data set which

characterizes the distinct CNS state corresponding to said ~~set of coefficients~~ at least one reference signal;

d) applying said wavelet transformation and statistical function to said ~~plurality of~~ at least one reference signals to produce ~~a plurality of~~ one or more reference data sets which distinguish ~~between~~ the distinct CNS states(s) corresponding to ~~said~~ each reference signals;

e) observing the brain activity of said subject to produce said observed signal;

f) applying said wavelet transformation and statistical function to said observed signal to produce an observed data set;

g) comparing the observed data set to one or more ~~of~~ said reference data sets; and

h) computing a numerical value or values representative of said ~~state~~ level of depression of the CNS of said subject which results from said comparison.

Claim 2 (original): The method of claim 1 wherein said observed and reference signals representing measured brain activity of a subject are

electroencephalograms.

Claim 3 (canceled)

Claim 4 (currently amended): The method of claim 1 wherein reference signal is only obtained from said one or more reference subject or subjects who are not the same individual as said observed subject.

Claim 5 (original): The method of claim 1 wherein said statistical function is selected from the group histogram, probability density function, standard deviation, or variance.

Claim 6 (currently amended): The method of claim 1 wherein said statistical function is a probability density function and is applied to the observed and reference signals at different times.

Claim 7 (original): The method of claim 1 used to measure neurological activity in said subject to ascertain the level of consciousness of said subject.

Claim 8 (original): The method of claim 1 used to measure neurological activity in said subject to ascertain the level of hypnosis of said subject.

Claim 9 (original): The method of claim 1 used to measure neurological activity in

said subject to ascertain the effects of anesthetic agents on the brain of said subject.

Claim 10 (canceled)

Claim 11 (original): The method of claim 1 used to measure neurological activity in said subject to obtain the pharmacodynamic and pharmacokinetic models of neurologic and psychoactive compounds and medicaments.

Claim 12 (original): The method of claim 1 used to measure neurological activity in said subject to ascertain titration and dosage profiles of neurologic and psychoactive compounds and medicaments.

Claim 13 (original): The method of claim 1 used to measure neurological activity in said subject to detect and ascertain the level of brain ischemia.

Claim 14 (original): The method of claim 1 used to measure neurological activity in said subject to ascertain the effects of neurologic and psychoactive compounds and medicaments on the brain of said subject.

Claim 15 (original): The method of claim 1 wherein said distinct CNS states represent any distinct states taken from the continuum from conscious to no brain activity.

Claim 16 (currently amended): The method of claim 15 wherein said distinct CNS states are selected from sedation, light anesthesia, deep anesthesia and substantially no brain activity.

Claim 17 (currently amended): The method of claim 1 wherein at least two reference signals are acquired, and said reference signals correspond to distinct CNS states which are two extreme states.

Claim 18 (currently amended): The method of claim 17 wherein said extreme states are fully conscious and substantially no brain activity.

Claim 19 (canceled)

Claim 20 (canceled)

Claim 21 (currently amended): The method of claim 1 wherein said wavelet transformation function is a wavelet packets transform.

Claim 22 (currently amended): The method of claim 1 wherein said wavelet transformation function is ~~a~~ any transform with ~~both~~ joint time and frequency localization properties.

Claim 23 (currently amended): The method of claim 1 wherein said wavelet

transformation function is a wavelet filter ~~with appropriate frequency response which yields said sets of coefficients representing the content of the brain activity in a specific frequency band~~.

Claim 24 (canceled)

Claim 25 (canceled)

Claim 26 (currently amended): The method of claim 1 wherein said comparison is done by computing the correlation metrics between the observed data set and the reference data sets.

Claim 27 (currently amended): The method of claim 1 wherein said comparison is done by means of a distance metrics between the observed data set and the reference data sets.

Claim 28 (canceled)

Claim 29 (canceled)

Claim 30 (original): The method of claim 1 wherein a single-channel electroencephalogram is used to provide the observed and reference signals.

Claim 31 (original): The method of claim 1 wherein a multiple-channel electroencephalogram is used to provide the observed and reference signals.

Claim 32 (currently amended): A system for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the ~~state~~ level of depression of the CNS of said subject, given at least one ~~a plurality of~~ reference signals, ~~each~~ said at least one reference signal corresponding to a distinct CNS state obtained from a at least one reference subject, given a wavelet transformation function which~~, when~~ is applied to ~~said observed signal and each of~~ one or more said reference signals, or portions thereof, to yields ~~a set~~ one or more sets of coefficients, and given a statistical function which~~, when~~ is applied to ~~the~~ said sets of coefficients ~~derived from each said reference signal~~, or portions thereof, to yields ~~a number of~~ one or more reference data sets which ~~characterize each said distinct reference signal and discriminates~~ distinguish ~~between~~ one or more said reference signals, said system comprising:

a) sensor for observing the electrical brain activity of said subject to produce an observed signal; and

b) digital signal processor for

~~i) applying said transformation function to at least one of said reference signals, or~~

~~portions thereof, to yield at least one set of coefficients;~~

~~ii) applying said statistical function to said set of coefficients derived from each said reference signal, or portions thereof, to yield at least one reference data set;~~

iii) applying said wavelet transformation function and said statistical function to said observed signal to produce an observed data set;

~~iv~~ii) comparing the observed data set to one or more ~~of~~ said reference data sets; and

~~v~~iii) computing a numerical value or values representative of said ~~state~~ level of depression of the CNS of said subject which results from said comparison.

Claim 33 (currently amended): A computer program product for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the ~~state~~ level of depression of the CNS of said subject, given at least one ~~a plurality of~~ reference signals, ~~each~~ said at least one reference signal corresponding to a distinct CNS state obtained from ~~a~~ at least one reference subject, given a wavelet transformation function which, ~~when~~ is applied to ~~said observed signal and each of~~ one or more said reference signals, or portions thereof, to yields ~~a set~~ one or more sets of coefficients, and given a statistical function which, ~~when~~ is applied to ~~the~~ said sets of coefficients ~~derived from each~~

~~said reference signal~~, or portions thereof, to yields ~~a number of~~ one or more reference data sets which ~~characterize each said distinct reference signal and discriminates~~ distinguish ~~between~~ one or more said reference signals, said computer program product comprising a computer usable medium having computer readable program code embodied in said medium for:

~~a) applying said transformation function to at least one of said reference signals, or portion thereof, to yield at least one set of coefficients;~~

~~b) applying said statistical function to said at least one set of coefficients derived from said at least one reference signal, or portion thereof, to yield at least one reference data set;~~

~~c)~~a) applying said wavelet transformation function and said statistical function to said observed signal to produce an observed data set;

~~d)~~b) comparing the observed data set to said at least one reference data set; and

~~e)~~c) computing a numerical value or values representative of said ~~state~~ level of depression of the CNS of said subject which results from said comparison.

Claim 34 (canceled)

Claim 35 (canceled)

Claim 36 (canceled)

Claim 37 (new): The method of claim 1 wherein said comparison is done by computing the difference between said observed and reference data sets using a vector p-norm.

Claim 38 (new): A system for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the level of depression of the CNS of said subject, given a time-frequency transformation and a statistical function said system comprising:

a) a device for acquiring the first reference signal, said reference signal corresponding to the awake CNS state, from at least one awake subject;

b) a device for generating the second reference signal, said reference signal corresponding to the CNS state of substantially no brain activity, using a time series of substantially zero values;

c) a device for applying said time-frequency transformation and statistical

function to the two said reference signals to produce two reference data sets;

d) a device for observing the brain activity of said subject to produce said observed signal;

e) a device for applying said time-frequency transformation and statistical function to said observed signal to produce an observed data set;

f) a device for comparing the observed data set to the two said reference data sets by computing the difference between the said observed and reference data sets using a vector p-norm; and

g) a device for computing a numerical value or values representative of said level of depression of the CNS of said subject which results from said comparison.

Claim 39 (new): A system for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the level of depression of the CNS of said subject, given a mathematical formula of Dirac function form, a time-frequency transformation and a statistical function said system comprising:

a) a device for acquiring the first reference signal, said reference signal

corresponding to the awake CNS state, from at least one awake subject;

b) a device for applying said time-frequency transformation and statistical function to the said first reference signal to produce the awake reference data set;

c) a device for generating the second reference data set using said mathematical formula of Dirac function form, said reference data set being a representation of the CNS state corresponding to substantially no brain activity;

d) a device for observing the brain activity of said subject to produce said observed signal;

e) a device for applying said time-frequency transformation and statistical function to said observed signal to produce an observed data set;

f) a device comparing the observed data set to the two said reference data sets; and

g) a device for computing a numerical value or values representative of said level of depression of the CNS of said subject which results from said comparison.

Claim 40 (new): A method for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the level of depression of the CNS of said subject, said method comprising:

a) generating a first reference signal, said reference signal corresponding to the awake CNS state, using a random noise signal generator function;

b) generating a second reference signal, said reference signal corresponding to the CNS state of substantially no brain activity, using a time series of substantially zero values;

c) selecting a time-frequency transformation function which, when applied to one of said reference signals yields a set of coefficients;

d) selecting a statistical function which, when applied to said set of coefficients derived from one of said reference signals, or a subset of that said set of coefficients, yields a reference data set which characterizes the distinct CNS state corresponding to that said reference signal;

e) applying said time-frequency transformation and statistical function to the two said reference signals to produce two reference data sets which distinguish the awake and substantially no brain activity CNS states;

f) observing the brain activity of said subject to produce said observed signal;

g) applying said wavelet transformation and statistical function to said observed signal to produce an observed data set;

h) comparing the observed data set to one or more said reference data sets; and

i) computing a numerical value or values representative of said level of depression of the CNS of said subject which results from said comparison.

Claim 41 (new): A method for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the level of depression of the CNS of said subject, given one or more algorithms, said method comprising:

a) generating at least one reference signal according to one of said algorithms, said reference signal corresponding to a distinct CNS state;

b) selecting a time-frequency transformation function which, when applied to one said reference signal, yields a set of coefficients;

c) selecting a statistical function which, when applied to said set of

coefficients derived from one said reference signal, or a subset of that said set of coefficients, yields a reference data set which characterizes the distinct CNS state corresponding to that said reference signal;

d) applying said time-frequency transformation and statistical function to one or more said reference signals to produce one or more reference data sets which distinguish the distinct CNS state(s) corresponding to that one or more said reference signals;

e) observing the brain activity of said subject to produce said observed signal;

f) applying said time-frequency transformation and statistical function to said observed signal to produce an observed data set;

g) comparing the observed data set to the one or more of said reference data sets; and

h) computing a numerical value or values representative of said level of depression of the CNS of said subject which results from said comparison.

Claim 42 (new): A system for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the level of

depression of the CNS of said subject, given one or more algorithms, a time-frequency transformation and a statistical function, said system comprising:

a) a device for generating at least one reference data set using one of said algorithms, said reference data set being a representation of a distinct CNS state;

b) a device for observing the brain activity of said subject to produce said observed signal;

c) a device for applying said time-frequency transformation and statistical function to said observed signal to produce an observed data set;

d) a device for comparing the observed data set to at least one said reference data set by computing the difference between the said observed and reference data sets; and

e) a device for computing a numerical value or values representative of said level of depression of the CNS of said subject which results from said comparison.